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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/535,305	02/08/2006	Jean Beguinot	Q88042	3751

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EXAMINER
ROE, JESSEE RANDALL

ART UNIT	PAPER NUMBER
1793	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/535,305	BEGUINOT ET AL.	
	Examiner	Art Unit	
	Jessee Roe	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 May 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) *8-13* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☒ Claim(s) *1* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *18 May 2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of the Claims

Claims 1-7 are currently under examination and claims 8-13 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected steel workpiece, there being no allowable generic or linking claim. Election was made with traverse in the reply filed on 23 May 2008. Applicant's election with traverse of claims 1-7 in the reply filed on 23 May 2008 is acknowledged.

The traversal is on the ground(s) that instant invention is patentably distinct from Beguinot (US 5,714,116) because in Beguinot (US 5,714,116), the titanium and zirconium contents are less than 0.3% and in the present invention Ti + Zr/2 has to be between 0.35% and 1.1%. In response, the Examiner notes that Beguinot (US 5,714,116) discloses (col. 1, lines 50-52) "optionally at least one element taken from Nb, V, Zr, and Ti, each in amounts less than 0.3%". With the amounts of Zr and Ti, the maximum would be less than 0.6 weight percent of Ti + Zr or less than 0.45 weight percent of Ti + Zr/2, which would overlap the range of between 0.35% and 1.1% of Ti + Zr/2 as instantly claimed. Therefore, the requirement is still deemed proper and is therefore made FINAL.

Specification

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract

on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure is objected to because it contains language which can be implied and the abstract exceeds 150 words in length. Correction is required. See MPEP § 608.01(b).

Claim Objections

Claim 1 is objected to because of the following informalities: “optionally from 0% to 1.5% of copper” as in line 20 because 0 weight percent copper could not be optionally included; "optionally at least one element selected from Nb, Ta and V at contents such that $Nb/2 + Ta/4 + V \leq 0.5\%$” would include 0 weight percent of niobium, tantalum and vanadium and 0 weight percent of niobium, tantalum, and vanadium could not be optionally included; and “optionally at least one element selected from Se, Te, Ca, Bi, Pb at contents which are less than or equal to 0.1%” would include 0 weight percent of sellenium, tellurium, calcium, bismuth, and lead and 0 weight percent of sellenium, tellurium, calcium, bismuth, and lead cannot be optionally included. Appropriate correction is required.

With respect to “X” in -70XCr” in line 40 of claim 1, "X" should be changed to "x" for consistency. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to the recitation “according to which the plate is subjected to a thermal quenching processing operation" in lines 32-33 and “ep being the thickness of the plate expressed in mm” in lines 43-44 of claim 1, the Examiner notes that "a workpiece or a plate are referred to in line 1 of claim 1 and "the workpiece or the plate" are referred to in lines 37, 41 and 45. Therefore, it is unclear whether the plate is the selected workpiece; the claim is open to any workpiece; or whether the limitations associated with lines 32-33 are in effect only when the selected workpiece is a plate and not for other workpieces.

With respect to the recitation “is subjected to a thermal quenching processing operation which is carried out in the heat for forming in the hot state and , for example, rolling heat, or after austenitization by reheating in a furnace, in order to carry out quenching" of claim 1, the phrase "for example" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. MPEP § 2173.05(d).

Claim 7 recites the limitation "the liquid steel". There is insufficient antecedent basis for this limitation in the claims.

The term "slowly" in claim 7 is a relative term which renders the claim indefinite. The term "slowly" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beguinot (US 5,714,116) alone, or alternatively in view of the ASM Handbook Volume 1.

In regards to claim 1, Beguinot ('116) discloses a method for producing an abrasion resistant steel sheet (workpiece) (col. 1, lines 26-31). The table below provides a comparison of the composition of the abrasion resistant steel workpiece disclosed by Beguinot ('116) with that of the instant invention (col. 1, line 25 – col. 2, line 20).

Element	From Instant Claims (weight percent)	Beguinot ('116) (weight percent)	Overlap (weight percent)
C	0.24 – 0.35	0.24 – 0.30	0.24 – 0.30
Si	0 – 2	0 – 2	0 – 2
Al	0 – 2	0 – 2	0 – 2
Si + Al	0.5 – 2	0.6 – 1	0.6 – 1
Mn	0 – 2.5	0 – 2	0 – 2
Ni	0 – 5	0 – 4	0 – 4
Cr	0 – 5	0 – 3	0 – 3
Mo	0 – 1	0 – 0.6	0 – 0.6
W	0 – 2	0 – 1.2	0 – 1.2

Element	From Instant Claims (weight percent)	Beguinot ('116) (weight percent)	Overlap (weight percent)
Mo + W/2	0.1 – 1	0.15 – 0.45	0.15 – 0.45
B	0 – 0.02	0.0005 – 0.005	0.0005 – 0.005
Ti	0 – 1.1	less than 0.3	less than 0.3
Zr	0 – 2.2	less than 0.3	less than 0.3
Ti + Zr/2	0.35 – 1.1	less than 0.45	0.35 – less than 0.45
S	0 – 0.15	-	-
N	less than 0.03	-	-

The Examiner notes that claimed amounts of carbon, silicon, aluminum, manganese, nickel, chromium, molybdenum, tungsten, boron, titanium, and zirconium overlap the amounts disclosed by Beguinot ('116), Which is prima facie evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the claimed amounts of carbon, silicon, aluminum, manganese, nickel, chromium, molybdenum, tungsten, boron, titanium, and zirconium because Beguinot ('116) discloses the same utility throughout the disclosed ranges.

With respect to the claimed amounts of sulfur and nitrogen, Beguinot ('116) does not specify that it would be necessary to add sulfur and nitrogen to the alloy. Therefore, Beguinot ('116) would encompass 0 weight percent sulfur and nitrogen and thus overlap claim 1. Alternatively, Beguinot ('116) does not specify the nitrogen and sulfur contents of the alloy.

The ASM Handbook Volume 1 discloses (pg. 407, col. 1) that nitrogen would be kept at levels of up to 0.02 weight percent to obtain steels at a reasonable cost and (pg. 577, col. 1) that sulfur would be contained at less than 0.04 weight percent in order to produce commercial quality cold-rolled sheet.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method for producing steel sheet, as disclosed by Beguinot ('116), by maintaining the nitrogen levels at up to 0.02 weight percent and the sulfur at less than 0.04 weight percent, as disclosed by the ASM Handbook Volume 1, in order to produce commercial quality cold-rolled steel sheets at a reasonable cost, as disclosed by the ASM Handbook Volume 1 (pg. 407, col. 1 and pg. 577, col. 1).

With respect to the recitations "$C^* = C - Ti/4 - Zr/8 - 7xN/8 \geq 0.095\%$" and "$1.05 xMn + 0.54xNi + 0.50xCr + 0.3x(Mo + W/2)^{1/2} + K > 1.8$ with: $K = 0.5$ if $B \geq 0.0005\%$ and $K = 0$ if $B < 0.0005\%$" of claim 1, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, In re Cooper and Foley 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, Taklatwalla v. Marburg, 620 O.G. 685, 1949 C.D. 77, and In re Pilling, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In the absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art. In re Austin, et al. 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the desired amounts of carbon, titanium, zirconium, nitrogen, manganese, nickel, chromium, molybdenum, tungsten and boron to satisfy the claimed compositional formulas from the ranges disclosed by Beguinot ('116) alone, or alternatively in view of the ASM Handbook Volume 1 because Beguinot ('116) alone, or alternatively in view of the ASM Handbook Volume 1 disclose the same utility throughout the disclosed ranges.

With respect to the recitation “is subjected to a thermal quenching processing operation which is carried out in the heat for forming in the hot state and , for example, rolling heat, or after austenitization by reheating in a furnace, in order to carry out quenching" of claim 1, Beguinot (‘116) discloses hot plastic deformation by rolling or forging (col. 4, lines 15-27); suggests oil or air quenching (col. 2, lines 37-46).

With respect to the recitations “the workpiece or the plate is cooled at a mean cooling rate greater than 0.5°C/s between a temperature greater than AC_3 and a temperature of from approximately T = 800 – 270xC* - 90xMn- 37xNi – 70XCr – 83x(Mo + W/2), to T-50°”; "the workpiece or the plate is then cooled at a mean core cooling rate Vr < 1150xep$^{-1.7}$ and greater than 0.1°C/s between the temperature T and 100°C, ep being the thickness of the plate expressed in m”; and “the workpiece or the plate is cooled as far as ambient temperature”, Beguinot (‘116) discloses that the steel would be cooled from Ac_3 down to room temperature in such a way that at every point in the steel, the cooling rate between Ac_3 and 450°C (which would overlap the range of between temperature T and 100°C) would be greater than 1°C/s (col. 2, lines 25-35).

With respect to the recitation “characterized in that: 1.05xMn + 0.54xNi + 0.50xCr + 0.3x(Mo + W/2)$^{1/2}$ + K > 2” of claim 2, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, In re Cooper and Foley 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, Taklatwalla v. Marburg, 620 O.G. 685, 1949 C.D. 77, and In re Pilling, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In the absence of evidence to the contrary, the selection of the proportions of elements

would appear to require no more than routine investigation by those of ordinary skill in the art. In re Austin, et al. 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the desired amounts of manganese, nickel, chromium, molybdenum, tungsten, and boron to satisfy the claimed compositional formulas from the ranges disclosed by Beguinot ('116) alone, or alternatively in view of the ASM Handbook Volume 1 because Beguinot ('116) alone, or alternatively in view of the ASM Handbook Volume 1 disclose the same utility throughout the disclosed ranges.

With respect to the recitation "characterized in that: Ti + Zr/2 $\geq$ 0.4%" of claim 3, the Examiner notes that Beguinot ('116) discloses (col. 1, lines 50-52) "optionally at least one element taken from Nb, V, Zr, and Ti, each in amounts less than 0.3%". With the amounts of Zr and Ti, the maximum would be less than 0.6 weight percent of Ti + Zr or less than 0.45 weight percent of Ti + Zr/2, which would overlap the range of Ti + Zr/2 $\geq$ 0.4% as instantly claimed.

With respect to the recitation "characterized in that: C* $\geq$ 0.12%" of claim 4, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, In re Cooper and Foley 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, Taklatwalla v. Marburg, 620 O.G. 685, 1949 C.D. 77, and In re Pilling, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In the absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art. In re Austin, et al. 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the desired amounts of carbon, titanium, zirconium, and nitrogen to satisfy the claimed

compositional formulas from the ranges disclosed by Beguinot ('116) alone, or alternatively in view of the ASM Handbook Volume 1 because Beguinot ('116) alone, or alternatively in view of the ASM Handbook Volume 1 disclose the same utility throughout the disclosed ranges.

With respect to the recitation "characterized in that: Si + Al $\geq$ 0.7%" of claim 5, Beguinot ('116) discloses 0.6 to 1 weight percent of silicon and aluminum (col. 1, line 25 – col. 2, line 20), which overlaps the claimed range.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beguinot (US 5,714,116) alone, or alternatively in view of the ASM Handbook Volume 1 as applied to claim 1 above, and further in view of the ASM Handbook Volume 4.

In regards to claim 6, Beguinot ('116) alone, or alternatively in view of the ASM Handbook Volume 1 discloses a method for producing an abrasion resistant steel sheet comprising oil or air quenching (col. 2, lines 37-46) (workpiece) as shown above, but Beguinot ('116) alone, or alternatively in view of the ASM Handbook Volume 1 does not specify tempering at a temperature less than or equal to a temperature of 350°C.

The ASM Handbook Volume 4 discloses tempering after quenching to relieve quenching stresses, ensure dimensional stability, and tempering in the range of 200°C to 300°C to transform austenite into ferrite and cementite (pg 121, cols. 1-2).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of producing an abrasion resistant steel sheet, as disclosed by Beguinot ('116) alone, or alternatively in view of the ASM

Handbook Volume 1, by tempering after quenching at a temperature in the range of 200°C to 300°C, as disclosed by the ASM Handbook Volume 4, in order to relieve quenching stresses, ensure dimensional stability and transform austenite into ferrite and cementite, as disclosed by the ASM Handbook Volume 4 (pg. 121, cols. 1-2).

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beguinot (US 5,714,116) alone, or alternatively in view of the ASM Handbook Volume 1 as applied to claim 1 above, and further in view of Takashima (US 3,883,347).

In regards to claim 7, Beguinot ('116) alone, or alternatively in view of the ASM Handbook Volume 1 discloses a method for producing an abrasion resistant steel sheet as shown above, but Beguinot ('116) alone, or alternatively in view of the ASM Handbook Volume 1 does not specify placing liquid steel in contact with a slag containing titanium.

Takashima ('347) discloses a method of adding a slag-forming agent containing metallic titanium and aluminum oxide to molten steel to deoxidize the molten steel and provide improved dephosphorizing and desulfurizing (col. 1, line 54 – col. 2, line 19).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add a slag-forming agent containing titanium and aluminum oxide, as disclosed by Takashima ('347), when making the abrasion resistant steel, as disclosed by Beguinot ('116) alone, or alternatively in view of the ASM Handbook Volume 1, in order to deoxidize the steel and provide improved dephosphorizing and desulfurizing, as disclosed by Takashima ('347) (col. 1, line 54 –

col. 2, line 19).

Still regarding claim 7, Takashima ('347) further discloses that increasing the size of the titanium particles would slow the reaction (diffusion of titanium into the molten steel) as particle sizes approach 20 mm or more (col. 2, lines 8-19).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessee Roe whose telephone number is (571) 272-5938. The examiner can normally be reached on Monday-Friday 7:30 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Roy V. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/John P. Sheehan/
Primary Examiner, Art Unit 1793

JR